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February 1964

PHOTOGRAPHIC INTERPRETATION REPORT

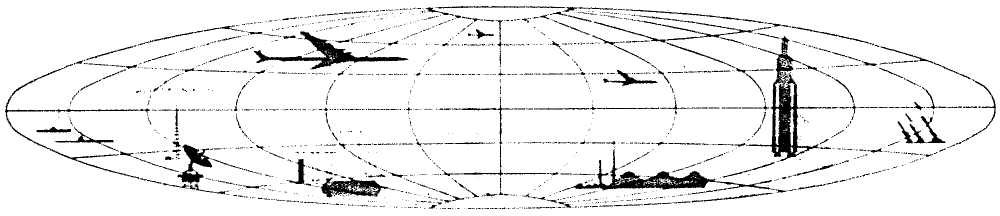
EARTH SATELLITE TRACKING AND COMMUNICATION CENTER SIMFEROPOL, USSR

CIA

DIA

25X1

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER



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PHOTOGRAPHIC INTERPRETATION REPORT

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PREFACE

This report, prepared in response to NSA and CIA requirements, describes both the Earth Satellite Tracking and Communications Center at Simferopol and various FLIM FLAM stations deployed across the Soviet Union.

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25X1D
25X1
25X1

The principal source of photographic material on the Simferopol location is [redacted] supplemented by ground photography [redacted] The FLIM FLAM sites were studied only on [redacted] photography. However [redacted] coverage was reviewed, for comparative purposes, if it was available.

25X1

No attempt has been made to determine the radiation or reception frequencies of the various antenna arrays at the center, the small scale of the [redacted] photography and the low resolution of the ground photography precluding such a detailed investigation. Also, the configuration of the antennas or "dishes" used by the various FLIM/FLAM stations cannot be resolved on the basis of presently available photography.

SUMMARY AND CONCLUSIONS

The Earth Satellite Tracking and Communication Center at Simferopol is probably the most important station in the USSR for tracking near-space orbiting objects. It is suspected that the antennas presently under construction at the center are to be used to bridge the gap between normal earth satellite tracking and communication work, presently performed by this center, and exospheric tracking, such as performed by the Deep-Space Probe Tracking and Communication Center at Yevpatoriya. 1/ Terrestrial communication media have already been established between these two centers to support any such joint tracking activity.

The center is the location of the Crimean FLIM FLAM station. Transmitting rhombic antennas oriented toward Moscow provide the communication link for this tracking activity.

The receiving fishbone antennas of the center are capable of receiving high-frequency (HF) communications from the triggering ships known to operate off the west coast of Africa. In addition, these antennas are capable of receiving from Africa, from the middle and northern Atlantic Ocean, and from Moscow--all in a continuous arc.

The center's telemetry collection site has antennas capable of receiving the COSMOS

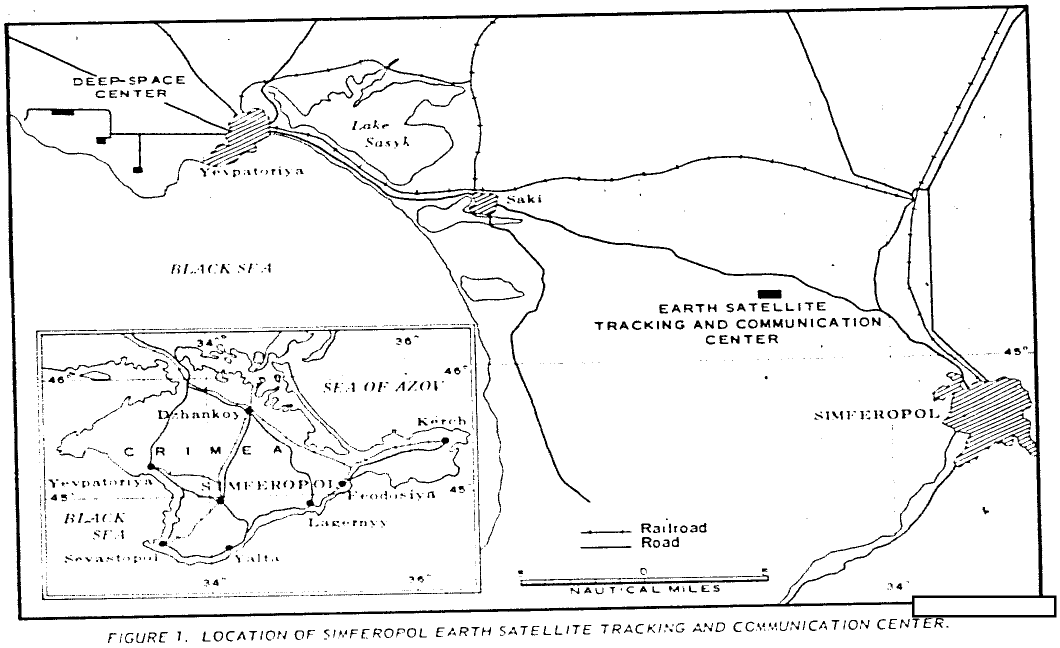

FIGURE 1. LOCATION OF SIMFEROPOL EARTH SATELLITE TRACKING AND COMMUNICATION CENTER.

25X1

radiophotography telemetry data which is known to "dump" somewhere over the Crimean Peninsula. Support for this collection program could be provided by either the transmitting rhombics or the probable DRUM HEAD troposcatter antenna.

The steerable communication array is suspected of being the antenna used for message transmittal to the manned satellites.

The role of the radio telescope is not completely understood, inasmuch as communication ties can be made with Yevpatoriya, Kharkov, or Moscow.

[redacted] 25X1

SIMFEROPOL EARTH SATELLITE TRACKING AND COMMUNICATION CENTER

The Earth Satellite Tracking and Communication Center is 11 nautical miles (nm) northwest of Simferopol at 45-03N 33-53E (Figure 1). Although the center was not identified [redacted] However, there were only 20 buildings in the support area [redacted] and

[redacted] 25X1 25X1D 25X1

FIGURE 2. SIMFEROPOL EARTH SATELLITE TRACKING AND COMMUNICATION CENTER, [redacted] 25X1D

at present there are approximately 60. Other areas were obscured by clouds in the [redacted] coverage. 25X1D

This is probably the principal earth satellite tracking and communication center in the USSR. [redacted] 25X1B

The Simferopol center consists of numerous space and terrestrial communication facilities, including (Figures 2 and 3): a radio astronomy station; an earth satellite tracking station described in this report as a FLIM FLAM station associated with the FLIM FLAM system; a probable satellite telemetry collection or "dump" site; terrestrial transmitting and receiving stations; a probable DRUM HEAD troposcatter antenna; a microwave tower; a steerable yagi antenna array; and an interferometer under construction. Two calibration towers are situated on a hill about 2,400 feet south of the center. Several of the above-mentioned items have been identified only on the ground photography [redacted] 25X1 [redacted] but their locations have been established through [redacted] photography. 25X1 25X1

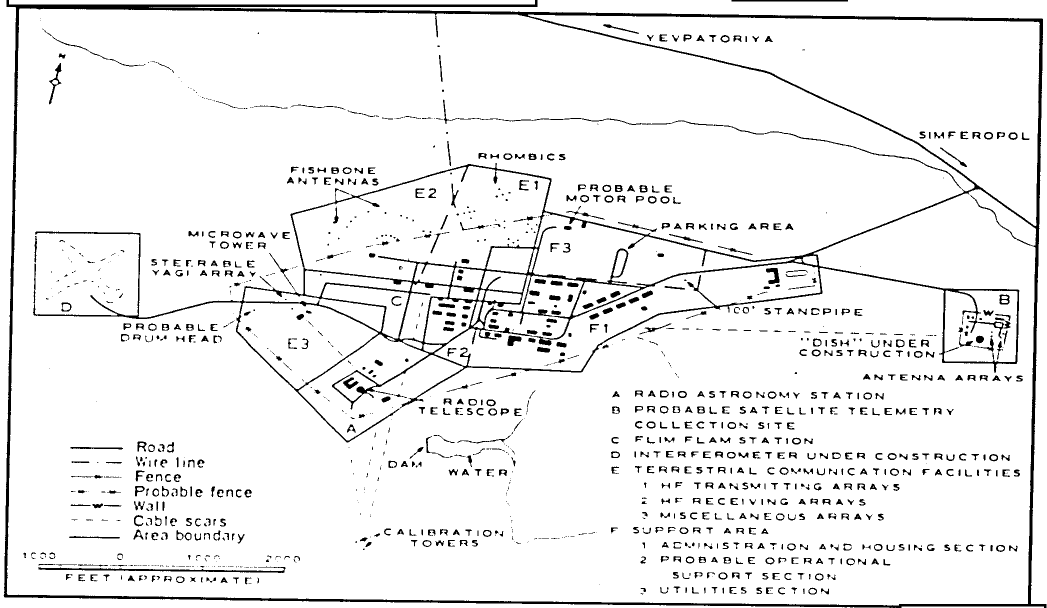

FIGURE 3. SIMFEROPOL EARTH SATELLITE TRACKING AND COMMUNICATION CENTER. [redacted] 25X1

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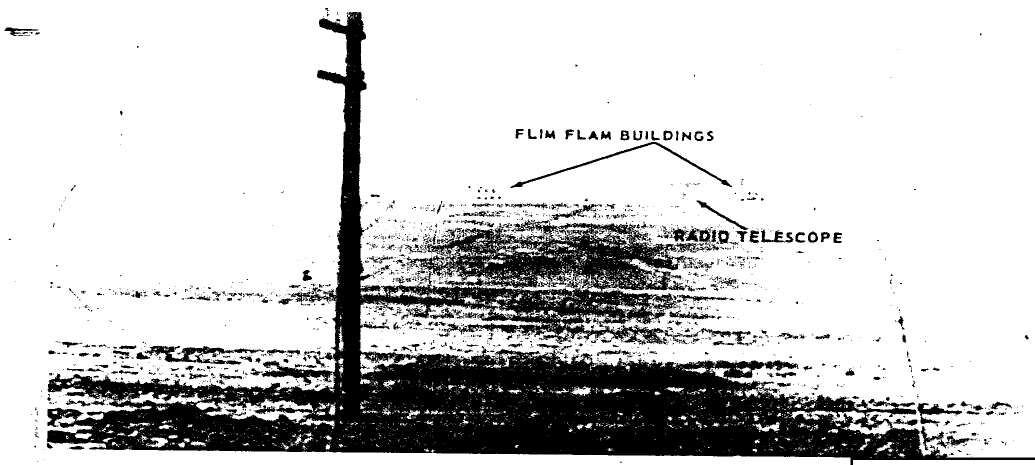

FIGURE 4. RADIO ASTRONOMY AND FLIM FLAM STATIONS AT SIMFEROPOL CENTER [redacted] 25X1D

RADIO ASTRONOMY STATION

The radio astronomy station is in the southwest part of the center (Figure 3, item A). 25X1D In addition to a steerable radio telescope, [redacted] 25X1 [redacted] in diameter, the station contains a large U-shaped multistory building approximately 165 by 125 feet with each wing 45 feet wide, a 95- by 40-foot building, a building approximately 110 by 25 feet, and four smaller strucures.

The large "dish" is mounted on a pedestal-like structure, and bulkiness visible on the ground photography (Figure 4) indicates probable trusswork support. With the "dish" in a horizontal position, the lip is approximately 65 feet above the ground. The "feed," supported by a 25X1D tripod or four-legged arrangement, is about [redacted] 25X1 [redacted] above the lip of the "dish." The depth of 25X1D the "dish" is approximately [redacted] General construction of the "dish" resembles the 22-meter radio telescope at Serpukhov (Figure 5), but the scale of the photography precludes precise determination of any "feed" differences or whether or not the reflector surface is solid.

The support pedestal for the radio telescope appeared to exist [redacted] 25X1D [redacted] 25X1D the "dish" was apparently complete.

A 125-foot-high calibration tower for the radio telescope is situated approximately 2,400 feet to the south. A cable scar extends from the tower to the "dish."

The station has a cable line connection with the adjacent terrestrial communication section that contains the microwave, probable tropo-scatter, and steerable vagi antennas.

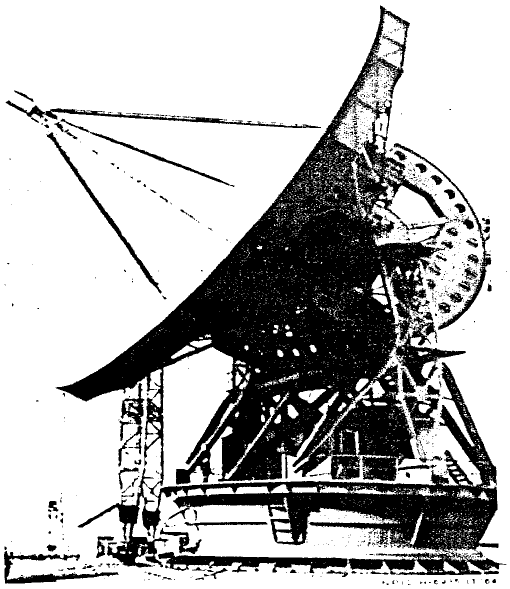

FIGURE 5. RADIO TELESCOPE AT SERPUKHOV, 1961.

PROBABLE SATELLITE TELEMETRY COLLECTION SITE

This separately secured area (Figure 3, item B), situated approximately 3,500 feet east of the administration and housing section of the center, measures 550 by 410 feet. Visual and physical security are provided by a [redacted] 25X1D high wall along all of the northern and approximately 370 feet of the eastern side; a probable fence along the remaining perimeter; and guard towers and night-lighting poles located along the inside of both wall and probable fence. The site was evident on coverage [redacted] 25X1D and is connected to the support area by road and cable line. 25X1D

Within the site are at least 4 completed antenna arrays and a large "dish" under construction (Figure 6). Of the 4 completed antenna arrays, 2 are similar in appearance, each consisting of 8 helix antennas arranged in 2 rows of 4. If present, the helix reflectors are wire-mesh type. Minimum dimensions for each of these 2 arrays are approximately 45 by 15 feet overall. The other 2 antenna arrays appear generally similar, but consists of 14 helices mounted in 2 rows of 7 antennas each on a flat or nearly flat, rectangular, solid or punched-hole reflector. These helices are each approximately [redacted] in length and approximately [redacted] 25X1 in diameter; each array measures [redacted] 25X1 overall. The "dish," approximately 90 feet in diameter, was resting on the ground and being assembled, though the mount or gantry had not been constructed [redacted] 25X1D

North of the antenna arrays there is a large single-story building approximately 85 by 35 feet. Adjacent to the building is an apron approximately 85 by 85 feet, probably concrete. There are five other buildings within the secured area, the four largest measuring 60 by 30 feet, 40 by 30 feet, and two 30 by 20 feet. Three of these have small adjoining aprons. The fifth building is a small, probable security building adjacent to the gate.

FLIM FLAM STATION

Two identical buildings, each with a probable dish-type antenna mounted on the roof, are situated in the western part of the center just to the north of the radio astronomy station (Figure 3, item C). [redacted] 25X1E 25X1

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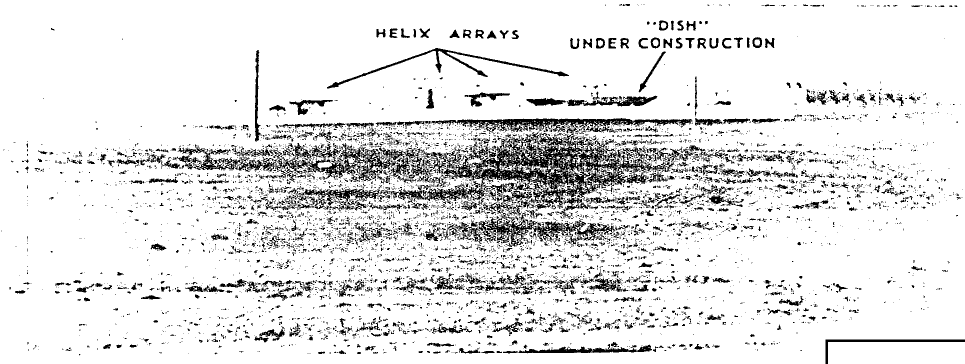


FIGURE 6. FROBABLE SATELLITE TELEMETRY COLLECTION SITE AT SIMFEROPOL CENTER [redacted] 25X1D

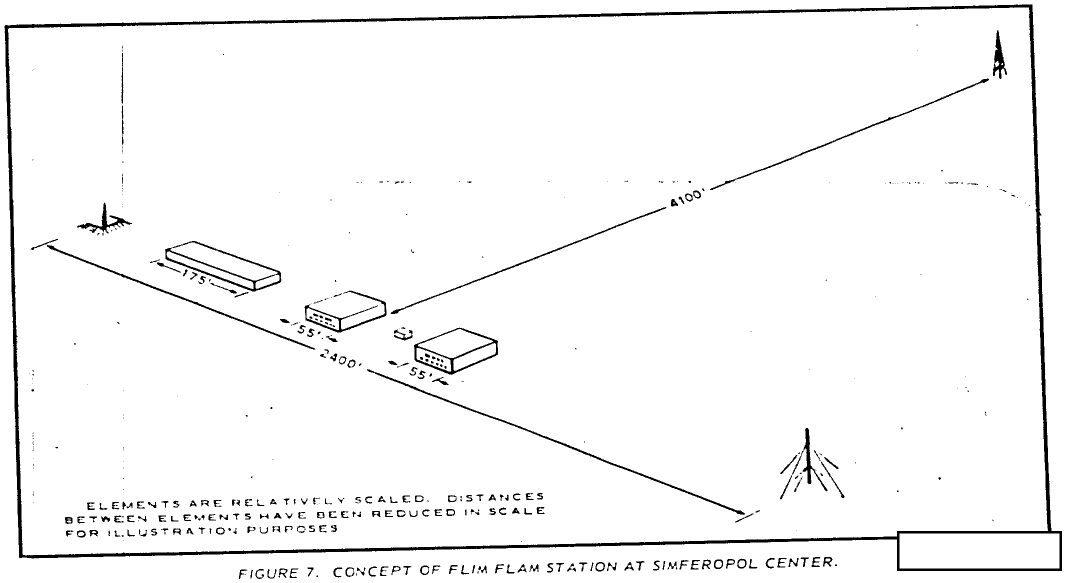
Each building is a two-story structure 80 by 55 feet and 20 feet high; taking a line between the antennas as a baseline, they are separated by 390 feet. Ground photography shows there are 10 windows on the north side of each building (Figure 4), and other ground photography indicates the probability of windows on other sides of each building. On the roof of each building is a [redacted] pedestal supporting a probable meshlike "dish" antenna, but photographic limitations preclude further identification. A small structure is located midway between the two buildings. 25X1D

In addition to the two prominent buildings and the small structure between them, several other apparently associated items were noted (Figure 7): a stick-mast antenna about 1,200 feet west of center and in line with the three structures; a 175- by 50-foot building about 680 feet east of center and also in line; a possible low, revetted tower about 1,200 feet east and also in line; and a circular area with a dark center lying north of the station. [redacted] 25X1

[redacted] 25X1D

A calibration tower for the FLIM FLAM station stands on a hill approximately 4,100 feet to the south. It is approximately 175 feet high and adjacent to the previously mentioned radio telescope calibration tower. A cable scar extends from the tower to the station.

Probably also associated with FLIM FLAM operations is a new interferometer under construction 3,600 feet west of the station, each diagonal of which is approximately 1,125 feet in length (Figure 3, item D).



[redacted] 25X1

FIGURE 7. CONCEPT OF FLIM FLAM STATION AT SIMFEROPOL CENTER.

TERRESTRIAL COMMUNICATION FACILITIES

The terrestrial communication facilities consist of two control buildings, HF transmitting rhombic antennas, HF receiving fishbone antennas, a probable DRUM HEAD troposcatter antenna, a steerable yagi antenna array, a tower supporting two microwave antennas, and an external wire line (Figure 3, items E1, E2, and E3, and Figure 8).

The HF transmitting antennas consist of a single, day rhombic and a double, night rhombic, both oriented generally toward Moscow (azimuth of 15 degrees). The HF receiving antennas consist of a fan of fishbone arrays arranged in a 135-degree arc that provides azimuthal coverage [redacted] The probable DRUM HEAD troposcatter antenna appears to be oriented generally toward Moscow or Kharkov. The microwave antennas appear to be oriented toward Yevpatoriya. The wire line runs north from the center to the Yevpatoriya-Simferopol road, and is then visible leading off toward Yevpatoriya. The steerable array appears to consist of four or five yagi antennas on a single pedestal mount.

25X1D

SUPPORT AREA

The center support area consists of an administration and housing section, a probable operational support section, and a utilities section.

The administration and housing section (Figure 3, item F1) contains approximately 42 buildings, most of which appear to be apartment type. The largest measurable buildings include:

1 U-shaped administration building, 200 by

35 feet, with wings 90 by 35 and 70 by 35 feet
1 L-shaped building, 150 and 140 by 45 feet
8 apartment-type buildings, each 135 by 40 feet
6 apartment-type buildings, each 135 by 50 feet
2 apartment-type buildings, each 135 by 60 feet
5 apartment-type buildings, 125 by 60 feet, 105 by 40 feet, 75 by 50 feet, 70 by 40 feet, and 60 by 45 feet
5 miscellaneous housing buildings, two 55 by 40 feet, one 45 by 30 feet, and two 30 by 30 feet.

Because of the small scale of the photography, it is not possible to give a more definite description of the approximately 14 other miscellaneous small structures in the section.

The probable operational support section (Figure 3, item F2), located adjacent to the FLIM FLAM station, contains 11 buildings, the largest of which include:

2 buildings, each 115 by 30 feet
2 buildings, each 95 by 40 feet
2 buildings, each 95 by 30 feet
2 buildings, 250 by 30 feet and 75 by 30 feet.

No attempt has been made to determine the precise function of each structure.

The utilities section (Figure 3, item F3) consists of a probable motor pool, a probable water supply, etc. The probable motor pool contains, in addition to a parking area, two buildings, 85 by 40 feet and 70 by 25 feet. A standpipe, 100 feet high, is situated between the administration building and the housing. A 65- by 40-foot building of unidentified function is northwest of the standpipe and adjacent to some undetermined activity. A probable water line leads from a nearby dam to the center.

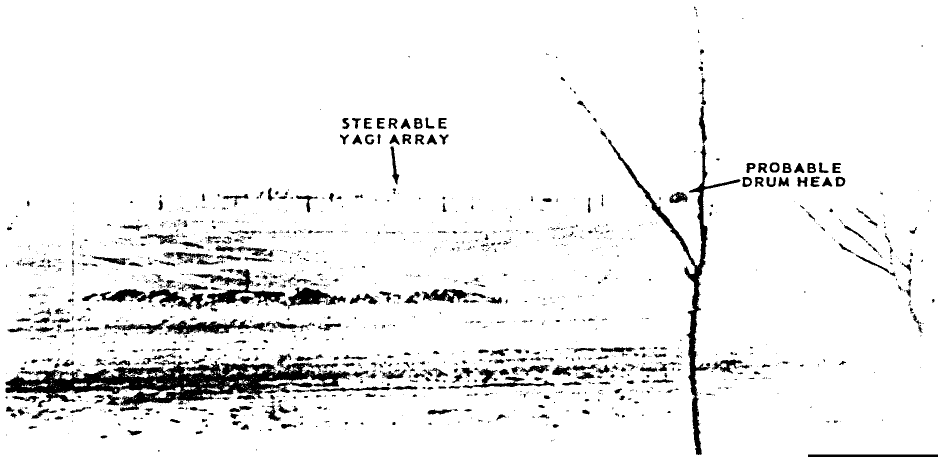


FIGURE 8. TERRESTRIAL COMMUNICATION FACILITIES AT SIMFEROPOL CENTER, [redacted] 25X1D

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OTHER EARTH SATELLITE TRACKING FACILITIES (FLIM FLAM) IN THE USSR

25X1B [redacted]

Ulan Ude

A probable candidate for Station 2 was identified at a communications facility 12.5 nm east-northeast of Ulan Ude. Since the quality of photographic resolution [redacted] is only fair, a candidate for Station 1S cannot be determined. Poor quality of earlier coverage precludes a negation date.

25X1D [redacted]

25X1D [redacted]

Sary-Shagan Antimissile Test Center (SSATC)

At SSATC, a station was identified adjacent to the interferometer at Instrumentation Site 1. [redacted] ported, [redacted]

25X1

25X1

Yeniseysk

The FLIM FLAM site is approximately 3 nm east-southeast of Yenisyesk and northwest of a possible interferometer. [redacted]

25X1

25X1

FIGURE 9. LOCATION OF OTHER FLIM FLAM FACILITIES IN THE USSR.

25X1 [redacted]

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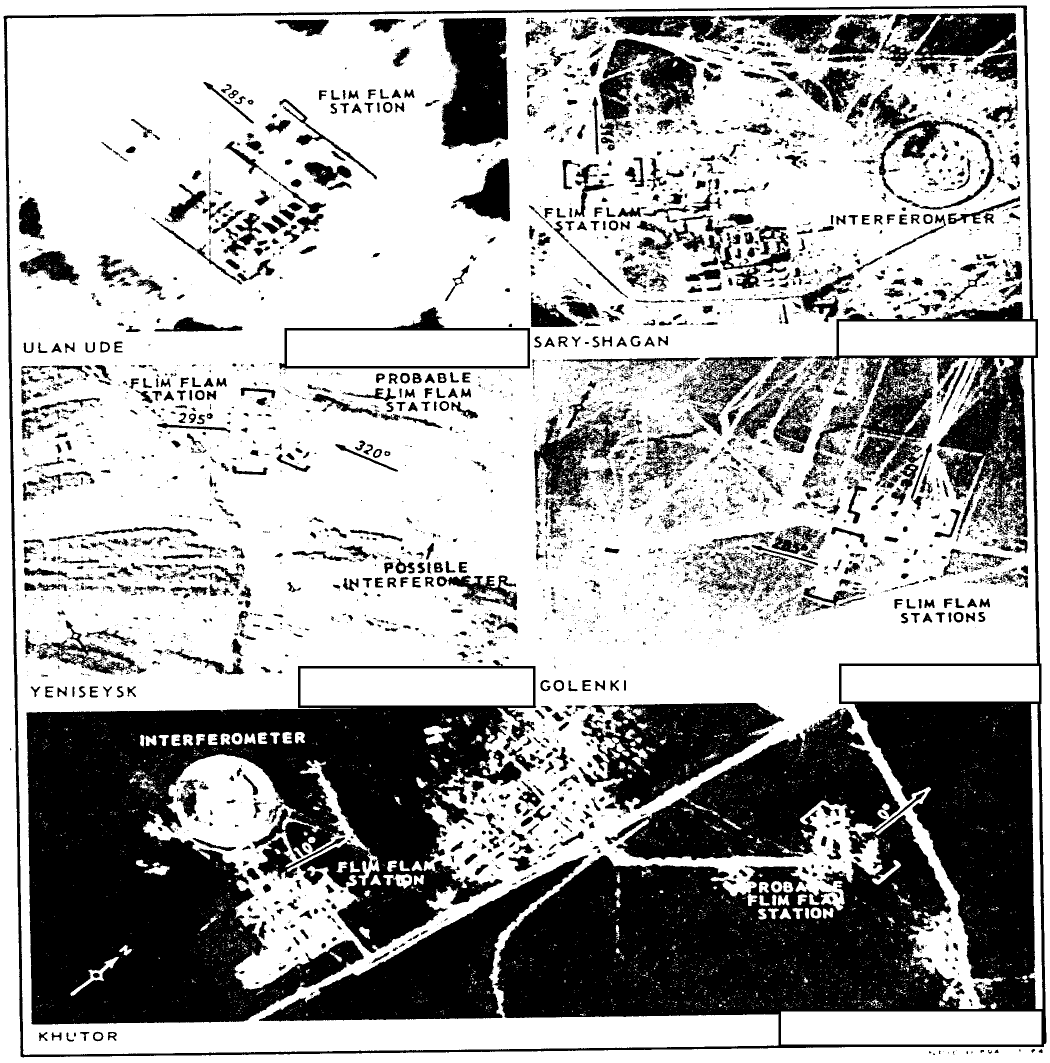

25X1D [redacted] 25X1D

25X1D [redacted] 25X1D

[redacted] 25X1D

FIGURE 10. OTHER FLIM FLAM FACILITIES IN THE USSR.

25X1B

25X1D [redacted]

raphy [redacted] does not appear on [redacted] coverage. 25X1D 25X1D

An additional pair of objects, approximately 425 feet apart, is situated about 1,000 feet southwest of the firm station and 835 feet south of the center of the interferometer. However, lack of sufficient evidence precludes identification of this activity as another station.

Khutor

25X1D [redacted]

The probable station, 2.5 nm south of Khutor, has one building with a probable roof top antenna clearly evident and a second building that appears bunkered or with its roof at ground level, though the probable antenna is visible (oriented at zero degrees). This facility, present on photography [redacted] does not appear on [redacted] coverage.

Golenki

The FLIM FLAM facility is one nm south of the center of Golenki [redacted] 25X1D 25X1D

been identified. The older of the two, oriented at 285 degrees, is probably Station 10 and was visible on photography [redacted] 25X1D 25X1D

[redacted] The newer station, oriented at 350 degrees, is probably Station 16. It was under construction [redacted] 25X1D 25X1D

[redacted] and appeared complete on photography [redacted] 25X1D

The buildings at probable Station 16, each approximately 100 by 80 feet, are larger than those at probable Station 10.

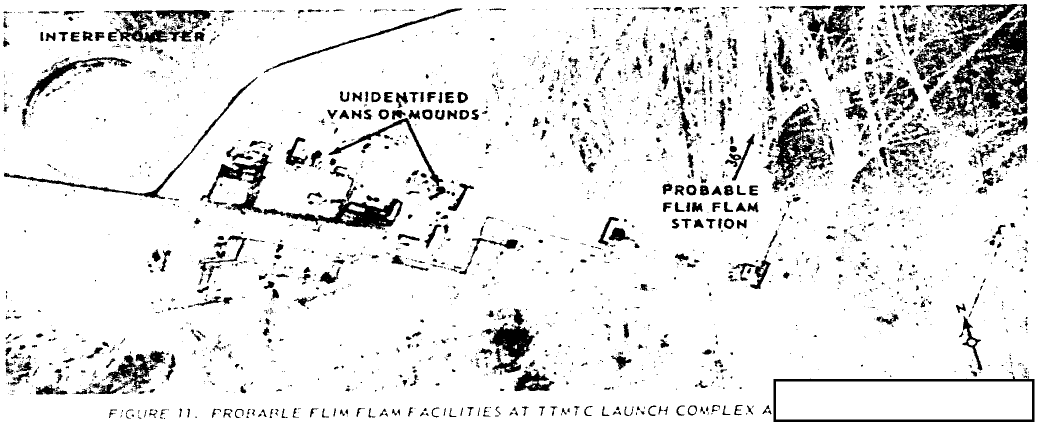

FIGURE 11. PROBABLE FLIM FLAM FACILITIES AT TTMTC LAUNCH COMPLEX A [redacted] 25X1D

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Tyuratam Missile Test Center (TTMTC)

A probable site, previously unlisted, was found at TTMTC Launch Complex A (Figure 11). The buildings appear similar to previously described structures, each being approximately 80 by 60 feet and 20 feet high. The baseline between antennas is 885 feet and the orientation is [redacted] degrees [redacted] the building to the northwest appeared complete, while the one to the southeast had an opening in the center of the roof and no antenna had been erected. Construction [redacted] 25X1

25X1D
25X1D

Adjacent to the northwest are two van-mounted probable parabolic "dishes" which are located on earth mounds. These have the same orientation [redacted] degrees) but their baseline is only 870 feet. [redacted] 25X1D 25X1D 25X1D

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[redacted]

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REQUIREMENTS

25X1 [redacted]

CIA. C-SI3-80,454

NPIC PROJECT

J-269/63